Laminar Flow Element differential pressure flowmeters are good for clean, dry, non-corrosive, non-condensing gasses. Corrected for temperature and pressure, it has a mass flow output. The EMI immunity and fast response (5 ms available) make the meters suitable for robotics' applications (painting or welding). A variety of outputs are available (4-20 mA, 0-5 V, and pulse). NIST traceable and CSA units are Type 4 weatherproof. The accuracy is less than 1% of reading subject to limitations described in the Specifications section.

The integrated LCD display can indicate flow rate or total as well as gas temperature and pressure.

Calibration is done on air with empirically derived conversion factors. Oxygen cleaning optional.

Sizes range from 1/8 to 3/4 inch threaded connections. Anodized aluminum is the standard material for the meter body and 316 Stainless Steel is available for use where external corrosion is a factor.
**Principles of Operation**

**PRINCIPLES OF OPERATION:** Flow of gas through a Laminar Flow Element generates a differential pressure between the absolute and downstream pressure sensors. This differential pressure is proportional to the flow velocity and viscosity of the gas. Mass flow rate is determined by utilizing the temperature and absolute pressure sensor to compensate for density variations of the gas.

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**General Specifications**

**Flow Ranges**
- High Pressure Drop (2.6 psi)\(^{1}\): 2 SLPM/5 SCFH F.S. to 1300 SLPM/2600 SCFH F.S.
- Turndown Ratio: 200:1 (100:1 Turndown ratio available for units ranged under 20 SLPM/40 SCFH F.S.)
- Accuracy: < +/- 1% of reading
- Repeatability: ± 0.2% of full-scale
- Response Time: 10-100 msec (user selectable)
- Gases: Air, Argon, Nitrogen, CO\(_2\), Oxygen, Helium, Hydrogen, Methane and mixtures
- Gas Compatibility: Non-corrosive, non-condensing
- Maximum Operating Pressure: 150 PSIG
- Burst Pressure: 200 PSIG
- Maximum Operating Temperature: 176 °F (80 °C)
- Minimum Operating Temperature: -13 °F (-25 °C)
- Process Connections: 1/8”-1/4”-3/8”-1/2”-3/4” NPT female (SAE, BSPT, BSPP available also)
- Display: LCD rate/total, multi-gas, alarms, multiple engineering units
- Wetted Parts:
  - Sensors: Ceramic, silicon, gold, epoxy, RTV
  - Flow Body Internals: Stainless steel, anodized aluminum, Viton®
  - Enclosure Rating: Type 4
- Note 1: Port to Port pressure drop at full-scale flow

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**Electrical Specifications**

**Supply Voltage:** 10–24 VDC (Intrinsically Safe)
**Supply Current:** 22 mA (max) for 4-20 mA loop-powered transmitters
**Output:** 4-20 mA (2-wire loop powered)
- 0-5 VDC, 0-10 VDC, 1-5 VDC, 2-10 VDC (all w & w/o alarms)
- 0-1000 Hz, 200-1200 Hz, Pulse Out
**Electrical Connection:** 5-pin or 8-pin connector
PIN CONNECTOR PINOUTS

**FS**

<table>
<thead>
<tr>
<th>Pin</th>
<th>Description</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>+24 VDC</td>
<td>6241-1M</td>
</tr>
<tr>
<td>2</td>
<td>0VDC (4-20mA Loop Return)</td>
<td>6241-3M</td>
</tr>
<tr>
<td>3</td>
<td>Alarm Common</td>
<td>6241-10M</td>
</tr>
<tr>
<td>4</td>
<td>Tare</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Alarm 1 +</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Alarm 2 +</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Chassis Ground</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Signal Output</td>
<td></td>
</tr>
</tbody>
</table>

**PIN CONFIGURATION:**
- 1: +24VDC
- 2: 0VDC (4-20mA loop return)
- 3: Signal Output
- 4: Tare
- 5: Alarm 1 +
- 6: Alarm 2 +
- 7: Chassis Ground
- 8: Signal Output

ACCESSORY CABLES AVAILABLE FOR PIN CONNECTOR METERS

<table>
<thead>
<tr>
<th>Series</th>
<th>Description</th>
<th>Length in Meters</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>FS</td>
<td>5 pin female</td>
<td>1</td>
<td>6241-1M</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3</td>
<td>6241-3M</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10</td>
<td>6241-10M</td>
</tr>
<tr>
<td>FS</td>
<td>8 pin female</td>
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<td></td>
<td></td>
<td>5</td>
<td>6242-5M</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10</td>
<td>6242-10M</td>
</tr>
</tbody>
</table>
How To Order Flowstream for a Single Gas

Select the appropriate symbols to build a model code:

Example: 

\[ \text{SERIES} = \text{FS} \]
\[ \text{MATERIAL FOR METER BODY} = \text{E} \]
\[ \text{SEALS} = \text{F} \]
\[ \text{FLOW RANGE IN SLPM} = \text{N} \]
\[ \text{FLOW RANGE IN SCFH} = \text{CO2} \]
\[ \text{PIPE SIZE IN INCHES} = \text{2} \]
\[ \text{FLOW RANGE IN SLPM} = \text{189 SCFH} \]
\[ \text{FLOW RANGE IN SCFH} = \text{X2A} \]

**FLOW RANGE IN SLPM**

<table>
<thead>
<tr>
<th>MIN FLOW</th>
<th>MIN/MAX F.S.</th>
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</tr>
</thead>
<tbody>
<tr>
<td>0.005</td>
<td>2.0</td>
<td>0.0125</td>
<td>5</td>
</tr>
<tr>
<td>0.075</td>
<td>30</td>
<td>0.15</td>
<td>60</td>
</tr>
<tr>
<td>0.05</td>
<td>5</td>
<td>0.1</td>
<td>10</td>
</tr>
<tr>
<td>0.45</td>
<td>180</td>
<td>0.9</td>
<td>360</td>
</tr>
<tr>
<td>0.45</td>
<td>180</td>
<td>0.9</td>
<td>360</td>
</tr>
<tr>
<td>0.75</td>
<td>300</td>
<td>1.5</td>
<td>600</td>
</tr>
<tr>
<td>1.75</td>
<td>700</td>
<td>3.5</td>
<td>1400</td>
</tr>
<tr>
<td>3.25</td>
<td>1300</td>
<td>6.5</td>
<td>2600</td>
</tr>
</tbody>
</table>

* Argon flow rates are 75% of the above values (multiply by 0.75) due to higher viscosity

**FLOW RANGE IN SCFH**

<table>
<thead>
<tr>
<th>MIN FLOW</th>
<th>MIN/MAX F.S.</th>
<th>MIN FLOW</th>
<th>MIN/MAX F.S.</th>
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<td>5</td>
<td>0.1</td>
<td>10</td>
</tr>
<tr>
<td>0.45</td>
<td>180</td>
<td>0.9</td>
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<td>1300</td>
<td>6.5</td>
<td>2600</td>
</tr>
</tbody>
</table>

**GAS TYPE**

- Air = A
- Argon* = R
- Carbon Dioxide = CO2
- Helium = HE
- Nitrogen = N
- Oxygen = O
- Hydrogen = H
- Methane = M

**OUTPUT**

- Digital Visual Display with Output
  - X2A = 4-20mA Intrinsically Safe
  - X4A = 0-5 VDC
  - X4B = 0-5 VDC with 2 alarms
  - X5A = 0-10 VDC
  - X5B = 0-10 VDC with 2 alarms
  - X12A = 1-5 VDC
  - X12B = 1-5 VDC with 2 alarms
  - X14A = 2-10 VDC
  - X14B = 2-10 VDC with 2 alarms
  - X19A = 0-1000 HZ
  - X20A = 200-1200 HZ
  - X22A = pulse out (rate varies with size)

- No Visual Display with Output
  - Z1A = 4-20mA
  - Z2A = 4-20mA Intrinsically Safe
  - Z4A = 0-5 VDC
  - Z5A = 0-10 VDC
  - Z12A = 1-5 VDC
  - Z14A = 2-10 VDC
  - Z19A = 0-1000 HZ
  - Z20A = 200-1200 HZ
  - Z22A = pulse out (rate varies with size)

**SPECIAL OPTIONS**

- CLEAN FOR OXYGEN SERVICE = C1
- VACUUM USE = ZVAC
- SPECIFIC PRESSURE (I.E. P10) = P ___
- ISOLATED CHASSIS GROUND = ZRC
- ACTUAL GAS CALIBRATION = GAS